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ABSTRACT

Many learners appear to approach learning in different yet reasonably consistent ways. The ability to recognize and take responsibility for these particular styles is an essential feature of efficient and effective planning and efficient and effective learning. Program planners can use knowledge about learning styles to develop programs that: (1) teach about learning styles; (2) model for the learner the implications of this knowledge; (3) provide learners with experiences that encourage the development of a wide variety of learning styles; and (4) do not disadvantage a particular learning style. This paper presents information about the learning profiles of 86 teacher education students using information gleaned from the Kolb Learning Style Inventory. According to Kolb, effective learners need ability in all of the following areas: concrete experience, reflective observation, abstract conceptualization, and active experimentation. Student preferences for distinctive ways of learning were clearly shown--abstract conceptualization was the most commonly preferred. Conclusions are drawn from the data and implications for program planning that better match the needs of learners are provided. Diagrammatic representations as suggested by Kolb are included. (Contains 17 references.) (Author/LL)

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Students' Learning Styles: Implications for Teacher Education

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Paper proposal:
Title: Students' Learning Styles: Implications for Teacher Education

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Paper Summary:

Many learners appear to approach learning in different yet reasonably consistent ways. The ability to recognise and take responsibility for these particular styles is an essential feature of efficient and effective planning and efficient and effective learning.
For course designers and planners, knowledge of participants' preferred learning styles has direct links to improving programs by informing program planning. Program planners can use knowledge about learning style to develop programs that -
• teach about learning styles
• model for the learner the implications of this knowledge.
• provide learners with experiences that encourage the development of a wide variety of styles.
• do not do disadvantage a particular learning style.
This paper will present information about learning profiles of teacher education students using information from the Kolb Learning Style Inventory. Conclusions will be drawn from this data along with implications for program planning that better matches the needs of learners.

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The learner:

"I learn through processes ..... generally start at step A and work my way through"

"I have a philosophy that I will always be learning, that's why I like meeting people because I always learn something from people I meet."

"I learn by hearing things three times - like practicing and watching."

"I learn best in a challenge situation. I only learn what I want to learn."

"I learn through experience and through my mistakes , through doing."

"I find it hard to motivate myself to learn. I've found I have to aim for a target, that target might be the final grade or result."

Learning Style:

There is a wide acceptance by educators of the concept of individual differences among learners in regard to such factors as ability, motivation, values, attitudes, personality. What is now emerging in education is the concept of individual difference as it relates to style of learning, that is that learners differ substantially in the way they go about learning.
In simplest terms, learning style can be defined as the way in which a learner prefers to do things that relate to learning.
Dunn [1984] notes that learning style is the way in which information is absorbed and retained, that is it describes not 'what' the learner learns but 'how' the learner learns.
At a more complex level, learning style can be conceived in terms of the permanent personality characteristics or traits that the learner may display over a range of tasks and situations [Biggs and Moore, 1993]. It is any observable pattern in the way in which a person accomplishes a task of a particular type [Schmeck, 1988].
Pithers and Mason [1992, p.61] define learning style as "a relatively consistent pattern of perception, interaction with and response to stimuli in a particular learning environment." Learning style encompasses both the perceiving and the processing of information and the consequent interaction between these two dynamics of learning.

There is some confusion in the literature between the terms 'cognitive style' and 'learning style'. The variations in definition appear to be differentiated in part by time; cognitive style being of earlier usage for the now more common term,

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learning style. Schmeck [1983] argues that apart from a few notable exceptions; he cites Biggs [1970] and Goldman and Warren [1973], most early research related to individual differences in learning "used traditional personality, attitudinal, cognitive style and ability measures... [however]....most of the early studies were not very definite." [Schmeck,1983, p.233]

Educational research in the 1960's and 1970's used the term cognitive style - eg Ausubel in 1968 used the term cognitive style to refer to " self consistent and enduring individual differences in cognitive organisation and functioning." [Ausubel, 1968, p.170]
Later researchers introduced the term 'learning style' as

> "a more useful concept than traditional personality and cognitive style constructs in accounting for variance in academic performance. They further stressed the need to assess learning style from a behavioural-process orientation."
>
> [Schmeck, 1983, p.233]

Learning style denotes a broader dimension than does cognitive style in that learning style includes the cognitive along with affective and psychological dimensions of learning [Keefe, 1987].

Schmeck [1983] suggests that whilst cognitive style can be considered as a habitual mode of processing information, learning style is the application of that cognitive style in any given learning situation or learning context.
There is a strong relationship between learning style and learning context. Contextual differences in the learning situation may be at the level of the mode of instruction, the objectives of the task as perceived by the learner or of the type of learning task.
An academic task in which the student's motives are merely to get the task completed will illicit a style different from that of a task where the learner's motives are to achieve high grades [Marton and Salsjo,1976a; 1976b; Biggs, 1987].
Context differences between learning tasks impose on or suggest to the learner, different strategies eg. a task that requires the application of a mathematical formula suggests and requires a different strategy than a learning task such as summarising a chapter of a text in order to complete a multiple choice exam [Ramsden, 1988]. Research supports the theoretical assumption that learners adopt context-specific learning strategies [Perry and Ryan, 1992]. Distinction must thus be made between learning strategies and learning style.
It can be suggested that a learner who shows a preference for a particular set of strategies in response to varied learning situations is demonstrating a particular learning style.
Learning strategies are the skills or tactics used to accomplish learning tasks thus learning strategies refer to those series or sequence of procedures or tactics that the learner uses to accomplish a specific learning task [Schmeck,1988].

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Learning strategies can be recognised as particular ways of problem solving related to and appropriate to, a particular task. For example, using the memory strategy of 'chunking' in order to remember [ie 'store'] an important phone number is an appropriate learning strategy for that particular task. Learning strategies have a particular relationship with specific learning activities.
Learning strategies or skills "are the tools we [may] have available in our cognitive tool kit" [Schmeck,1988, p.5].
Learning style can be distinguished from learning strategy. Learning style relates more to the way the learner has, over time and because of experience, adapted to a particular learning context. "Style resides within the person and relates to genetics and prior experience." [Schmeck, 1988, p.17]

Learning style can not be revealed by a single observation nor does it emerge from interaction with a single learning context. An individual's learning style preferences or repertoire emerges from multiple and long term experiences.

Kolb's Learning Style Inventory:

Kolb [1985] offers a description of a cycle of learning that in part helps understand the development of styles of learning adopted or demonstrated by particular learners. Kolb's experiential learning model conceptualises the learning process as a four stage cycle.

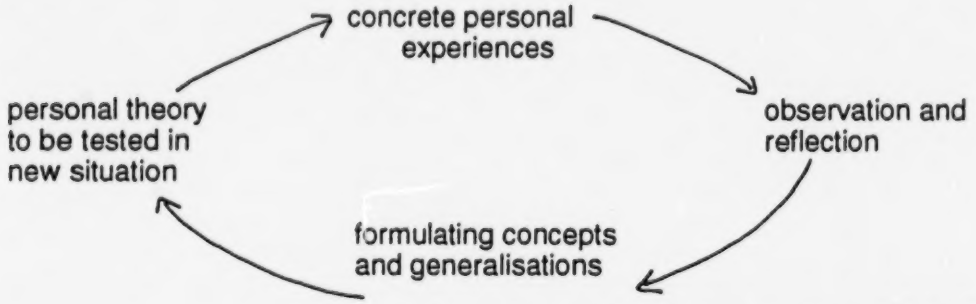
concrete personal experiences
observation and reflection
formulating concepts and generalisations
personal theory to be tested in new situation

Figure1: the conceptual four stage learning model [after Kolb,1985]

This model conceives learning in which

> "immediate concrete experience forms the basis for observation and reflection. These observations are assimilated into concepts from which new implications for action can be deduced. These implications or hypotheses then serve as guidelines in creating new experiences."
> [Kolb,1985, p.2]

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According to Kolb, effective learners need ability in all four areas:

- Concrete Experience[CE],
- Reflective Observation [RO],
- Abstract Conceptualization [AC] and
- Active Experimentation [AE].

Kolb's description of these stages is relatively abstract and general and confusion may arise when attempting to differentiate each stage if used primarily as a description of an individuals learning cycle through which he or she progresses ie a description of the sequence of learning that is entailed.
A more productive way to use Kolb's cycle and descriptors is to focus on each dimension and use each as a set of characteristics of a particular approach or style of learning. Kolb's orientation allows for this focus. He states that

> "learning requires abilities that are polar opposites and that the learner, as a result, must continually choose which set of learning abilities he [or she] will bring to bear in a specific learning situation."
>
> [Kolb,1976, p.3]

However over time, as a result of the complex interaction of inherited factors and experiences in a variety of learning situations, an individual will consistently resolve the dialectic tension between the polar opposite dimensions in a characteristic fashion and develop a preferred learning style that emphasises some characteristics over others.

Kolb's Learning Style Inventory was devised to measure an individuals learning style, the style developed as an outcome of the experience of learning. The Inventory allows for the identification of differences among individuals in terms of their individual learning preferences that have been built on growth in experience and personal insight.
The Inventory [1978] is a nine item self description questionnaire which assess the respondents preferred style of learning. Each item asks the respondent to rank order four words in a way that best describes his or her learning style. Four scores are generated to assess the degree to which a student prefers to learn. Kolb identifies these modes as Concrete Experience[CE], Reflective Observation [RO], Abstract Conceptualization [AC] or Active Experimentation [AE].

Characteristics identified as common to the **Concrete Experience** mode include a receptive, experienced-based approach to learning emphasising feeling based judgements. Individuals learn best from being involved in real situations and prefer learning interactions with peers rather than authority figures.

Characteristics identified as common to the **Reflective Observation** mode include the use of impartial and careful observation in understanding the meaning of ideas and situations. Formal learning situations eg lectures are preferred as they allow the role of objective observer.

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Characteristics identified as common to the **Abstract Conceptualization** mode include an analytic, conceptual approach to learning. Impersonal learning situations which emphasise theory and systematic analysis are preferred. These learners do not benefit from 'discovery learning' situations.

Characteristics identified as common to the **Active Experimentation** mode include an active 'doing' orientation toward learning relying heavily on experimentation. Preference is for situations that allow risk taking in for example small group work or individual projects.

[Kolb,1978]

The Study:

Kolb's Learning Style Inventory was administered to students in their second year of a Bachelor of Education program. Results from this group of students [n = 86] illustrate a representation of all four styles [see Table 1.]

Table 1.

Students showing a preference for -	of total group
Concrete Experience	15 %
Reflective Observation	18 %
Abstract Conceptualization	25 %
Active Experimentation	30 %
Results from 12 % of the students showed an equal preference for two styles.	

Table 2 indicates that this distribution is as would be expected for this occupational group [ie teachers], except in one category. The results indicated a higher representation of students preferring Abstract Conceptualization as a learning style than would be expected for this occupational group.

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Table 2.

Style	Student Group Mean	Population Mean [Kolb] for primary teachers
Concrete Experience	16.37	16.86 [SD 2.95]
Reflective Observation	14.88	12.92 [SD 3.03]
Abstract Conceptualization	18.04	14.62 [SD 3.23]
Active Experimentation	17.83	16.62 [SD 2.83]

Learners in this study clearly showed a preference for distinctive ways of learning, abstract conceptualization being the most commonly preferred learning style for this group of teacher education students.

Implications for Teacher Education:

These findings give support for the notion that knowledge of individual learning styles can form a productive basis for curriculum planning, implementation and evaluation. Increasing our knowledge and understanding of the learning styles preferred by our students can provide a rationale for course design as well as a model for the learning process.

For course designers and planners, knowledge of participants' preferred learning styles has direct links to improving programs by informing program planning. Those working in teacher education programs can use this knowledge about learning style to develop programs that -

- teach about le..ning styles
- model for the learner the implications of this knowledge.
- provide learners with experiences that encourage the development of a wide variety of styles.
- do not disadvantage a particular learning style.

In our teacher education programs we should inform students of their preferred learning styles. We should not be interested in providing this information for its own sake but to provide knowledge to the students about how they learn so that they are then empowered to control their own learning through the style they use or the adaptations they are able to make in style according to particular learning purposes and / or environments.

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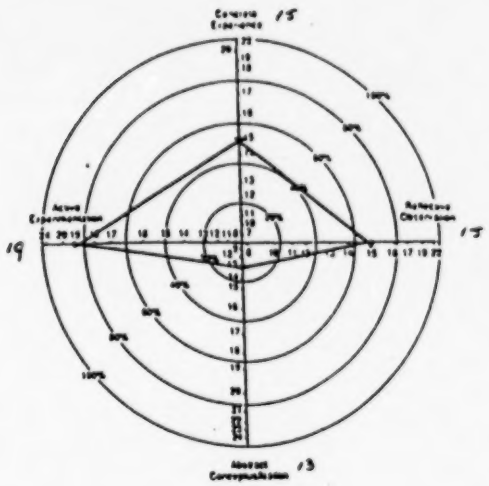
To encourage good learning it is not enough to merely accommodate and support preferred learning styles. We should devise learning activities for our students that cater for a range of learning styles and plan for activities that will encourage the learner to develop more confidence and strength in less preferred styles thus enabling students to expand their learning style repertoire.

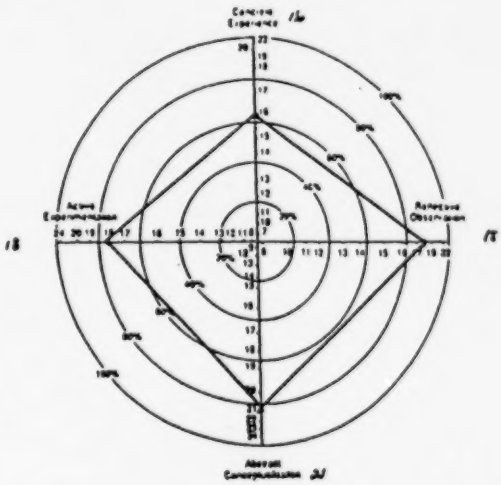
Diagrammatic representation as suggested by Kolb [1976] graphically illustrates this concept

Learning Style profile norms for two learners:

Louisa



Jacqui

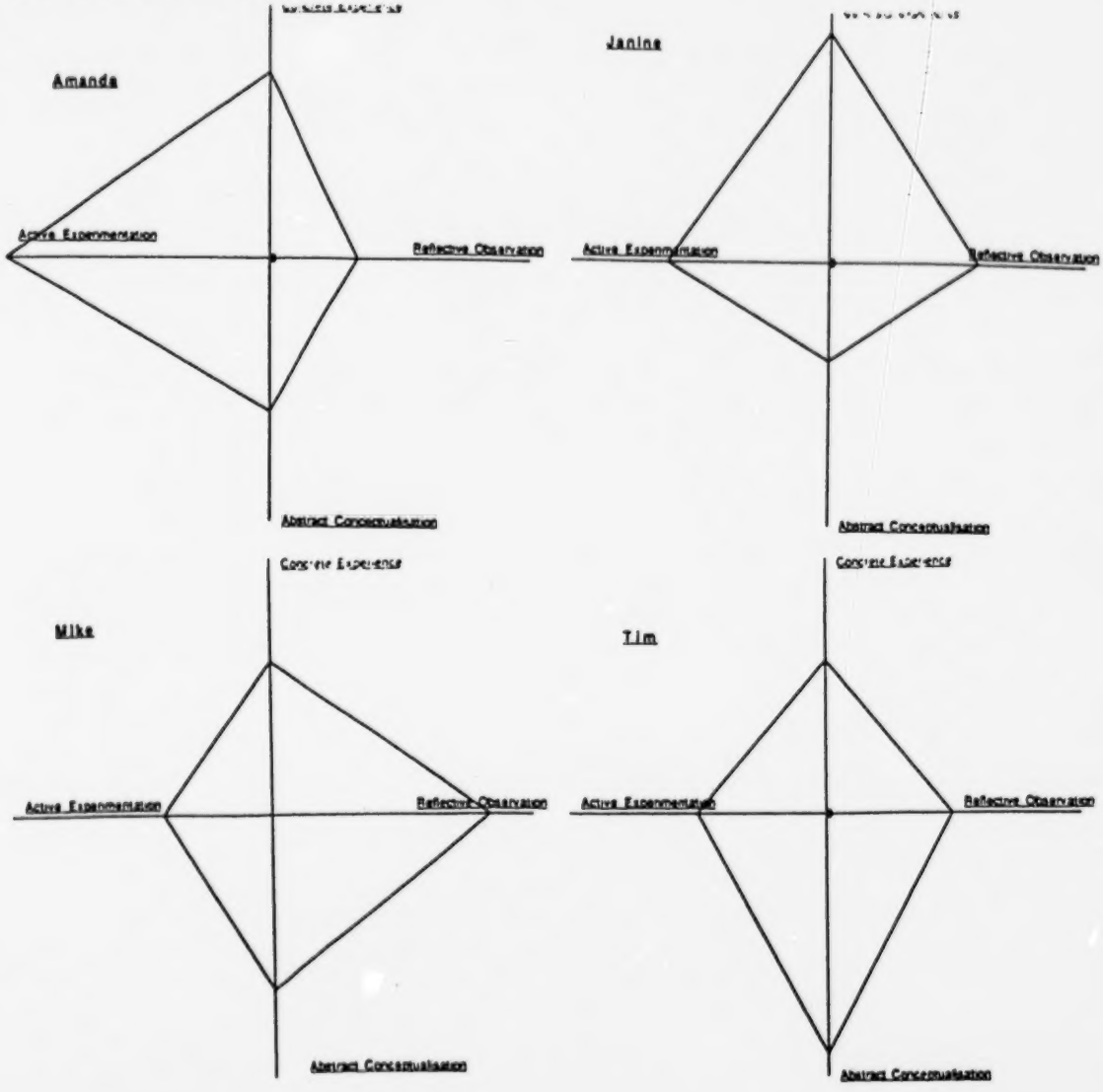


The profile of preferred modes for Jacqui illustrates a more balanced style than does that as illustrated for Louisa. Jacqui's profile suggests that she has experienced a wide variety of learning contexts enabling her to develop greater flexibility of style. She will be much more likely to be able to work effectively in a variety of learning contexts. Louisa has probably had a less varied learning environment. Louisa could well participate in activities that require her to, for example, practice and adopt skills of logical thinking and rational evaluation in order to increase her repertoire.

Our programs should not only teach about learning style but model the implications of this knowledge for our students. By sharing with students the rationale used to develop our courses, we can help model curriculum development and as future teachers this information will also help our students to demystify the teaching - learning process. For course planners, knowledge of learning style can inform the nature of assessment. Assessment tasks should provide for a range of techniques that do not disadvantage a particular learning style.

The most effective learner is able to make use of different learning styles. We should plan courses that encourage this development.
A teacher could present impulsive learners with activities where they have to reflect on particular sections and take time to reach a solution. Conversely the reflective learner could be presented with activities where choice has to be made quickly, where the learner has to take a risk in offering a solution. When activities are planned, care should be taken to include those which will require a range of abilities to reach a solution. When learners are presented with activities or problems to solve they should be encouraged to first reflect on the type of strategies needed for a resolution.

The capacity to work in teams has been identified as a key competency [Mayer, 1992]. The ability to interact effectively with others is an essential component of good learning. This skill includes the ability to recognise "the needs and aspirations of others as well as one's own contribution". [Mayer, p.22] This would include the recognition of one's own and others preferred style of learning.
If we are working with students in groups we need to carefully consider the structure of these groups in regard to the preferred learning styles of the students [Perry, 1993].
Consider these four learners.



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Each places emphasis, that is shows preference for, one style over another. As well, each illustrates a preference for a different style. This diagrammatic representation of style helps us to understand why conflict may occur when learners are working on group activities for example. Without an understanding of differences in preferred styles, Amanda and Mike may, for example, be heading for disaster if working together. Amanda wants to get started, to get the job going whilst Mike prefers to wait, to observe, to reflect. Conflict also could occur if Janine and Tim were working together. Tim feels it best to look for the rules, rely on the structure, whilst Janine feels these theoretical approaches are unhelpful and prefers to see the problem as unique where rules have to be created.

An understanding of preferred learning styles allows those working with learners to set up co-operative learning groups that encourage learners to observe another's way of learning and as well to discover that in order to complete some problems it is effective to accommodate diversity. A complex problem can be efficiently solved by having someone who can reflect on the problem, someone else who can build a general theory, another who is able to resolve the practical implications along with a fourth who can hold the group together.
If Amanda, Mike, Janine and Tim know about and understand how each other prefers to work and solve problems then activities can be planned that will take best advantaged of each style. Jobs can be shared where styles complement rather than conflict with each other.
An understanding of personal learning style preference gives each learner a better choice of learning activities - those activities which are likely to suit and those which are best avoided unless the learner is given help and support.

For those working with learners, an understanding of learning preferences allows for the provision of activities where an individual is best able to learn and an understanding of where an individual will most likely need assistance.
Enabling learners to understand more about how they learn, gives them and those who work with them, the opportunity to be more efficient and effective learners and teachers.

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